

Before the  
**FEDERAL COMMUNICATIONS COMMISSION**  
Washington, DC 20554

In the Matter of )  
 )  
Amendment of Subpart D of )  
Part 68 of the FCC's Rules )  
and Regulations )

**RECEIVED**

MAR 9 1995

FEDERAL COMMUNICATIONS COMMISSION  
OFFICE OF SECRETARY

**PETITION FOR RULEMAKING**

**TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

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**DOCKET FILE COPY ORIGINAL**

**PETITION FOR RULEMAKING**

Pursuant to the Commission's Rules, 47 CFR §1.401, the Telecommunications Industry Association ("TIA") respectfully submits this Petition for Rulemaking to amend Subpart D of Part 68, 47 CFR §§68.300 - 68.318, and portions of 47 CFR §68.2 in order to harmonize this Subpart D with the corresponding sections of the Canadian certification regulations CS-03. In the spirit of the North American Free Trade Agreement ("NAFTA"), these proposed amendments will help promote barrier-free trade between Canada and the United States by the introduction of similar technical requirements for the registration/certification of terminal equipment for both countries.

## **I. BACKGROUND AND STATEMENT OF INTEREST**

TIA is a national trade organization with more than 570 member companies engaged in the manufacture, sale and distribution of telecommunications equipment, including terminal equipment. The technical work of TIA is carried on through Engineering Committees sponsored by one of four product-oriented Divisions. TR-41 is one such Engineering Committee sponsored by the User Premises Equipment Division ("UPED") of TIA. UPED, via its Engineering Committees, develops, maintains and publishes voluntary standards and technical reports with respect to user premises equipment coming within the scope of Part 68 of the Commission's rules and regulations ("Part 68"). In its work, UPED seeks to cooperate with other national and international bodies in order to eliminate barriers to trade in telecommunications equipment. TIA uses Standards to help achieve market access. The TIA Engineering Manual states TIA's Policy to work towards International Cooperation and Harmonization. Specifically it states:

TIA's trade policy goals include removal of barriers to market access, full participation of U.S. government and industry in the standards setting process worldwide, and achievement of a minimum level of standards required to ensure interoperability and proper function of the international network. In the spirit of these goals, TIA encourages its committees and staff to work cooperatively with other members of the [American National Standards Institute ("ANSI")] confederation and with international standards bodies and counterpart national and regional standards bodies outside the United States to harmonize telecommunications equipment standards and avoid unnecessary duplication of effort. To this end, TIA will share its standards and specifications, whether work in process or completed works, with counterpart standards organizations in other countries, subject to the intellectual property rights and other property and contractual rights of third parties and any applicable laws and government regulations.

Thus, TIA cooperated with its counterparts in Canada to work on harmonization of Part 68 and CS-03. TIA is also active in, and serves as United States Secretariat for, the Consultative Committee on Telecommunications ("CCT"), a tri-lateral group of private and public sector representatives addressing issues arising under Chapters 9 and 13 of the NAFTA and other issues. The CCT has Working Groups active on issues related to product safety, electromagnetic compatibility, conformity assessment, telecommunications networks, mobile services, training and cooperation, premises distribution systems, and terminal equipment attachment.

Among the objectives of TIA, and UPED, is the facilitation of trade in goods and services among nations, including Canada and the United States, in a manner consistent with the interests of United States industry and the international obligations of the United States as reflected in NAFTA. Promoting such trade will help the economies in all involved countries strengthen the positions of the parties in international standards-setting activities.

In September, 1990, the TR-41.9 Subcommittee sponsored by UPED proposed a project to address the differences between the Canadian certification requirements (CS-03) and Part 68. The focus of this effort was the technical requirements of both countries and the ability to harmonize requirements so that terminal equipment would need to meet only one set of technical rules to comply with both countries' requirements. A joint working group co-chaired by Canada and the United States was approved and the work was begun. Ad Hoc groups were chartered to examine each section of the requirements and make proposals for harmonized

requirements. The attached Appendixes reflect the results of that effort. All interest groups in the industry in the U.S. and Canada were represented including carriers, manufacturers, laboratories, consultants, and government personnel. Exhibit A identifies the entities involved in this multi-year effort.

The Canadian requirements underwent similar scrutiny and the results of that effort have been proposed to Canada's Terminal Attachment Program Advisory Committee ("TAPAC") for adoption. While the vast majority of the requirements have been harmonized there are a few minor differences reflecting regulatory differences between the two countries. However, adoption of this proposal will allow terminal equipment in both countries to be designed to harmonized technical requirements, tested one time to show compliance to those requirements, and then have the associated testing results filed with the appropriate regulatory body to seek certification or registration for the respective country. This greatly simplifies design and allows opportunities for increased trade and economic growth.

Throughout this effort, TIA has kept in close contact with the Domestic Facilities Staff of the FCC. Discussions were held with the Branch Chief to have this proposal considered for the Negotiated Rulemaking process so that it might be considered by the Commission on a "fast track" basis. On February 18, 1994, at the suggestion of the FCC, an industry Seminar was held in the Washington, D.C., area to explain the proposal and to highlight the proposed amendments and elicit any technical concerns with the proposed harmonized requirements. At that time the proposal was favorably received by Seminar participants, a list of which is attached as

Exhibit B. Some technical concerns were raised and these issues were addressed with subsequent activities of TR-41.9 and Canadian counterparts at TR-41 meetings in March and June of 1994. In March, 1994, in Clearwater, Florida, TIA also sponsored a Seminar to discuss Part 68, CS-03, NAFTA, Conformity Assessment, and other issues. An overview of the Harmonized requirements was also presented at that time to the industry attendees which included participants from the United States, Canada, and Mexico.

## **II. SUMMARY OF PROPOSED AMENDMENTS**

2.1 GENERAL. The proposed amendments to Subpart D of the Rules and their supporting rationale are set forth in Appendix A. Appendix B contains a complete rewrite of Subpart D with all proposed amendments incorporated into the text.

The majority of the amendments are editorial in nature. The working group felt that certain of the current requirements of Subpart D are unclear and needed to be revised for clarity. Others require changes in order to meet today's environment.

The requirements relating to Message Registration ("MR") and Automatic Identification of Outward Dialing ("AIOD") have been deleted as this technology appears to have been replaced and to date no equipment has been registered for these services.

No changes have been proposed for Section 68.316, Hearing-Aid Compatibility.

2.2 ENVIRONMENTAL SIMULATION SECTION (§68.302). This Section has been completely reworked to address today's conditions. The Vibration and Temperature and Humidity stresses have been deleted as the working group concluded that these stresses do not produce failures causing harm to the network. The mechanical shock stresses have been revised to reduce the applicable tests to equipment susceptible to that kind of stress. Equipment weighing over 5 kilograms is not likely to experience this kind of stress and the mechanical shock requirements have been eliminated.

The surge testing requirements have been divided into two surge tests. The purpose of this revision is to assure that terminal equipment surged under the existing requirements will not harm the network. There was a great deal of discussion pertaining to the existing surge requirement. That requirement was felt to be too harsh for today's terminal equipment. It was believed that, with today's fused design, applying the existing surge would blow the fuse and could mask other potential harm to the network. That, coupled with industry reports of numerous equipment failures because of lesser surges actually being experienced throughout the United States, led the working group to include both surges in the proposed requirements. This should achieve the goal of Part 68 to help prevent network harm and should also lessen consumer frustration with damaged equipment.

2.3 LEAKAGE CURRENT LIMITATIONS SECTION (§68.304). This Section has been revised to clarify the requirements. The 60 Hz value was changed to 50 or



60 Hz to harmonize with international frequencies and the Underwriters Laboratories ("UL") and Canadian Standards Association ("CSA") dielectric standards.

**2.4 HAZARDOUS VOLTAGE LIMITATIONS SECTION (§68.306).** This Section has been revised to delete the requirements for Message Registration and Automatic Identification of Outward Dialing. The 80 Volt DC requirement has been changed to 60 Volts to harmonize with international safety standards. A Table has been added to provide a summary of the ring-trip requirements. Numerous editorial changes have been made to improve the clarity of the requirements.

**2.5 SIGNAL POWER LIMITATIONS SECTION (§68.308).** This Section has been reworded for clarity. It was agreed that the Table which references the programming resistors in Subpart F of the rules should be duplicated in this Section for ease of reference. The Through Gain Table has been revised to reflect proposed new services such as Integrated Services Digital Networks ("ISDN") being considered by the FCC and to be consistent with the Private Branch Exchange ("PBX") Loss Level Plan. References to the 4-wire Conventional Terminating Set interface have been deleted because it is believed that this equipment is no longer used and that no equipment has been registered for this application. References to MR and AIOD have also been deleted. The subrate digital channel rates have been expanded to include all the rates presently used by the industry. No new technical requirements were needed to accommodate the expansion of these subrates. The pulse template for the 1.544 digital pulse has been harmonized with the ANSI T1 standard pulse template.

## **2.6 TRANSVERSE (LONGITUDINAL) BALANCE LIMITATION SECTION**

**(§68.310)**. This Section has been renamed Transverse Balance Limitations to harmonize with the Institute of Electrical and Electronics Engineers ("IEEE") definition for transverse balance. The entire Section has been reworded to increase its utility and readability.

**2.7 ON-HOOK IMPEDANCE LIMITATION SECTION (§68.312)**. This Section has been reorganized and reworded for clarity. Ringer types C-Q have been removed as they no longer apply. The 40 k-Ohm maximum AC impedance has similarly been deleted. The definition of ringer equivalence has been revised to apply only to the AC impedance during ringing. Those sections that address message registration and voiceband private lines have been deleted.

**2.8 BILLING PROTECTION SECTION (§68.314)**. This Section has been reworded for clarity. The operating requirements for AIOD have been deleted. A new section has been added to clarify the reverse battery billing requirements. The direct inward dialing billing requirements have also been reworded for clarity.

**2.9 ADDITIONAL LIMITATIONS SECTION (§68.318)**. References to the 1.544 kbps digital keep-alive requirements have been deleted as the date of compliance has passed and the rule is no longer required. The requirements for automatic dialing equipment have also been modified to limit automatic dial calls to wrong numbers and to avoid harm to the network by tying up the network unnecessarily.

2.10 MISCELLANEOUS AMENDMENTS. In addition to the amendments to Subpart D OF Part 68, additional changes are proposed in Appendix A to other Subparts. Certain definitions in §68.3 are added, changed or deleted. The Scope of Part 68 is amended to delete references to Message Registration and Automatic Identification of Outward Dialing as well as other Sections in the rules. A proposal is made to grandfather MR and AIOD equipment that remains connected to the network under the existing grandfathering provisions. In addition, a rule is proposed grandfathering presently registered equipment and requiring registration in compliance with the new requirements only for new equipment.

### **III ONCE THE RULES ARE CHANGED, A METHOD TO KEEP THEM HARMONIZED NEEDS TO BE ADOPTED**

Tremendous technical efforts have been expended to create a set a technical requirements harmonized between the United States and Canada. Work is on-going looking at the technical requirements for terminal equipment attachment in Mexico. However, all of these efforts will be for naught, unless a process is developed that will keep harmonized technical requirements harmonized over time. This means that the processes used to change Rules must have similar timeframes in order to maintain the same requirements across each country. TIA believes the work of the CCT will help in this regard and that the FCC must utilize a process that is consistent with other governments once harmonized technical requirements have been developed.

Harmonization across North America will also provide a baseline to foster other harmonization efforts throughout the Americas and with other countries including those in Europe.

#### **IV. CONCLUSION**

The rules proposed in this Petition should be adopted as promptly as possible to demonstrate the commitment of the United States to barrier-free trade in North America. These proposals have already received extensive review by the industry affected. The proposed amendments harmonize the Canadian and United States technical requirements for registration/certification of terminal equipment and will also foster the United States position on mutual recognition with Mexico and the European Union.

Respectfully submitted,

#### **TELECOMMUNICATIONS INDUSTRY ASSOCIATION**

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GTE (U.S.)  
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SPRINT (U.S.)  
SOUTHWEST BELL (U.S.)  
STENTOR (C)  
ALBERTA GOVERNMENT TELEPHONE (C)  
BRITISH COLUMBIA TELEPHONE (C)  
BELL ATLANTIC (U.S.)  
BELL CANADA (C)  
BELLCORE (U.S.)  
BELL SOUTH (U.S.)

**MANUFACTURERS**

AMP (U.S.)	MITEL (C)
AT&T (U.S.)	NORTHERN TELECOM (C & U.S.)
CODEX/MOTOROLA (U.S.)	RELIANCE COMM/TEC (U.S.)
ERICSSON (U.S.)	ROLM/SIEMONS (U.S.)
FUJITSU (U.S.)	TECCOR (U.S.)
GENERAL DATACOMM (U.S.)	THOMSON CONSUMER (U.S.)
IBM (U.S.)	VERILINK (U.S.)

**LABORATORIES/CONSULTANTS**

ACTION CONSULTING (U.S.)  
CERTELECOM LABORATORIES (U.S. & C)  
COMMUNICATIONS CERTIFICATION LABS (U.S.)  
GTE TESTMARK (U.S.)  
INCHCAPE/DSG (U.S.)  
INDUSTRY CANADA (C)  
MOBILE ENGINEERING (U.S.)

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INDUSTRY CANADA

List of Participants at the Part 68 Forum held on February 18, 1994 at Stouffer Crystal City

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Tom Thompson	General Datacomm
Burce Touzel	Newbridge
Bill vonAlven	FCC
Victor Zubar	Washington Labs

Appendix A  
Proposed Harmonized Subpart D  
Part 68  
FCC Rules and Regulations

The following Appendix contains the proposed text for the changes to Part 68, Subpart D. Changes are introduced as follows:

**Reworded** = This indicates a rewording of the Section to clarify the intent of the rule.

**Changed** = This indicates a technical change in the rule.

**Delete** = This indicates a deletion of either part or all of a section.

Where minor editorial changes have been made, i.e., replaced "with respect to one milliwatt" with dBm the change was made without notation.

Where text changes were made that could affect the rule ~~strikeouts~~ (for deletions) and underlining (for insertions) have been utilized.

**§ 68.300 Labelling requirements.**

(New)

(c) When the device is so small or for such use that it is not practical to place the statements specified in this section on it, the information required by § 68.300(a) and (b) shall be placed in a prominent location in the instruction manual or pamphlet supplied to the user. The FCC Registration Number and the model number shall be displayed on the device.

***Rationale for Harmonized Requirement:***

*Section (c) has been added because many devices are either too small or do not have adequate space to display all the information required by Part 68. The Registration Number and the model number will provide sufficient information to identify the device and access the necessary records. This proposed change is part of the NPRM in CC Docket 93-286.*



**§ 68.302 Environmental simulation.**

(Delete)

(a) *Vibration.*

Deleted

(b) *Temperature and Humidity.*

Deleted

***Rationale for Harmonized Requirement:***

*The requirements for vibration, temperature and humidity have been deleted as it is the opinion of the working group that these tests have not produced failures that have caused harm to the network.*

**§ 68.302 Environmental simulation.**

(Reworded)

Unpackaged registered terminal equipment and registered protective circuitry shall comply with all the ~~criteria contained in the rules and regulations~~ rules specified in this subpart, both prior to and after the application of ~~each of~~ the mechanical and electrical stresses specified in this section, notwithstanding that certain of these stresses may result in partial or total destruction of the equipment.

Both telephone line surges, Type A and Type B, shall be applied as specified in § 68.302(b) and § 68.302(c). Different failure criteria apply for each surge type.

*Rationale for Harmonized Requirement:*

*The first paragraph was slightly reworded to add "unpackaged" to the text in order to clarify the requirement. The second paragraph was added to clarify that registered terminal equipment is subject to both surges.*

**§ 68.302 Environmental simulation.**

(Reworded & Delete)

(a) *Shock.* (1) Registered Terminal Equipment and Registered Protective Circuitry Equipment Unpackaged:

Deleted

(b) The drop tests specified in the mechanical shock ...

Deleted

(Reworded)

(a) *Mechanical Shock.*

(1) *Hand-Held Items Normally Used at Head Height:* 18 random drops from a height of 1.5 meters onto concrete covered with 3 millimeters asphalt tile or similar surface.

(2) *Table (Desk) Top Equipment 0-5 kilograms:* Six random drops from a height of 750 millimeters onto concrete covered with 3 millimeters asphalt tile or similar surface.

(3) *The drop tests specified in the mechanical shock conditioning stresses shall be performed as follows:* The unit should be positioned prior to release to ensure as nearly as possible that for every six drops there is one impact on each of the major surfaces and that the surface to be struck is approximately parallel to the impact surface.

***Rationale for Harmonized Requirement:***

*The section has been reworded and renumbered. The proposed harmonized drop shock tests represent the working group's view of the necessary tests for assuring continued compliance of the terminal equipment under test. Any installed equipment that weighs more than 5 kilograms is not likely to experience this kind of shock, however, equipment that is normally either carried or located where it may fall, e.g., desk top, shall be subjected to these tests.*

*The drop shock for other equipment, 0-10 kg has been eliminated as part of the requirements based on UL/CSA recommendation that a stress from a 3 to 6 inch drop is not likely to produce harm to the network.*

**§ 68.302 Environmental simulation.**

(Changed)

*(b) Telephone Line Surge - Type A.*

(1) *Metallic.* Apply two metallic voltage surges (one of each polarity) between any pair of connections on which lightning surges may occur; this includes (i) tip to ring, (ii) tip 1 to ring 1 and (iii) for a 4-wire connection which uses simplex pairs for signalling, tip to ring 1 and ring to tip 1.

The surge shall have an open circuit voltage waveform in accordance with Figure 68.302(a) having a front time ( $t_f$ ) of 10  $\mu$ s maximum and a decay time ( $t_d$ ) of 560  $\mu$ s minimum, and shall have a short circuit current waveshape in accordance with Figure 68.302(b) having a front time ( $t_f$ ) of 10  $\mu$ s maximum and a decay time ( $t_d$ ) of 560  $\mu$ s minimum. The peak voltage shall be at least 800 volts and the peak short circuit current shall be at least 100 amperes. Surges are applied:

(A) With the equipment in all states that can affect compliance with the requirements of Part 68. If an equipment state cannot be achieved by normal means of power, it may be achieved artificially by appropriate means;

(B) With equipment leads not being surged (including telephone connections, auxiliary leads, and terminals for connection to non-registered equipment) terminated in a manner which occurs in normal use;

(C) Under reasonably foreseeable disconnection of primary power sources, with primary power cords plugged and unplugged, if so configured.

(2) *Longitudinal.* Apply two longitudinal voltage surges (one of each polarity) from any pair of connections on which lightning surges may occur, this includes the tip-ring pair and the tip 1 - ring 1 pair, to earth grounding connections; and to all leads intended for connection to non-registered equipment, connected together.

The surge shall have an open circuit voltage waveform in accordance with Figure 68.302(a) having a front time ( $t_f$ ) of 10  $\mu$ s maximum and a decay time ( $t_d$ ) of 160  $\mu$ s minimum, and shall have a short circuit current waveshape in accordance with Figure 68.302(b) having a front time ( $t_f$ ) of 10  $\mu$ s maximum and a decay time ( $t_d$ ) of 160  $\mu$ s minimum. The peak voltage shall be at least 1500 volts and the peak short circuit current shall be at least 200 amperes. Surges are applied:

(i) With the equipment in all states that can affect compliance with the requirements of Part 68. If an equipment state cannot be achieved by normal means of power, it may be achieved artificially by appropriate means;

(ii) With equipment leads not being surged (including telephone connections, auxiliary leads, and terminals for connection to non-registered equipment) terminated in a manner which occurs in normal use;

(iii) Under reasonably foreseeable disconnection of primary power sources, with primary power cords plugged and unplugged, if so configured.

(3) *Failure Modes resulting from application of Type A telephone line surges.* Regardless of operating state, equipment and circuitry are allowed to be in violation of the longitudinal balance requirements of §68.310(b) and (c) and, for terminal equipment connected to Local Area Data Channels, the longitudinal signal power requirements of §68.308(f)(3), provided that:

(i) Such failure results from an intentional, designed failure mode which has the effect of connecting telephone or auxiliary connections with earth ground; and,

(ii) If such a failure mode state is reached, the equipment is designed in such a manner that it would become substantially and noticeably unusable by the user, or an indication is given (e.g., an alarm), in order that such equipment can be immediately disconnected or repaired.

NOTE: The objective of this Subsection is to allow for safety circuitry to either open-circuit, which would cause a permanent on-hook condition, or to short-circuit to ground, as a result of an energetic lightning surge. Off-hook tests would be unwarranted if the off-hook state cannot be achieved. A short to ground has the potential for causing interference resulting from longitudinal imbalance, and therefore designs must be adopted which will cause the equipment either to be disconnected or repaired rapidly after such a state is reached, should it occur in service.

(c) *Telephone Line Surge - Type B.*

(1) *Metallic.* Apply two metallic voltage surges (one of each polarity) to equipment between any pair of connections on which lightning surges may occur; this includes (i) tip to ring, (ii) tip 1 to ring 1 and (iii) for a 4-wire connection which uses simplex pairs for signalling, tip to ring 1 and ring to tip 1.

The surge shall have an open circuit voltage waveform in accordance with Figure 68.302(a) having a front time ( $t_f$ ) of  $9 \mu s (\pm 30\%)$  and a decay time ( $t_d$ ) of  $720 \mu s (\pm 20\%)$  and shall have a short circuit current waveshape in accordance with Figure 68.302(b) having a front time ( $t_f$ ) of  $5 \mu s (\pm 30\%)$

and a decay time ( $t_d$ ) of  $320\mu s$  ( $\pm 20\%$ ). The peak voltage shall be at least 1000 volts and the peak short circuit current shall be at least 25 amperes. The wave shapes are based on the use of ideal components in Figure 68.302(c) with  $S_2$  in Position M. Surges are applied:

(A) With the equipment in all states that can affect compliance with the requirements of Part 68. If an equipment state cannot be achieved by normal means of power, it may be achieved artificially by appropriate means.

(B) With equipment leads not being surged (including telephone connections, auxiliary leads, and terminals for connection to non-registered equipment) terminated in a manner which occurs in normal use.

(C) Under reasonably foreseeable disconnection of primary power sources, with primary power cords plugged and unplugged, if so configured.

(2) *Longitudinal.* Apply two longitudinal voltage surges (one of each polarity) from any pair of connections on which lightning surges may occur, this includes the tip-ring pair and the tip 1 - ring 1 pair to earth grounding connections and to all leads intended for connection to non-registered equipment, connected together.

For each output lead of the surge generator, with the other lead open, the surge shall have an open circuit voltage waveform in accordance with Figure 68.302(a) having a front time ( $t_f$ ) of  $9\mu s$  ( $\pm 30\%$ ) and a decay time ( $t_d$ ) of  $720\mu s$  ( $\pm 20\%$ ) and shall have a short circuit current waveshape in accordance with Figure 68.302(b) having a front time ( $t_f$ ) of  $5\mu s$  ( $\pm 30\%$ ) and a decay time ( $t_d$ ) of  $320\mu s$  ( $\pm 20\%$ ). The peak voltage shall be at least 1500 volts and the peak short circuit current shall be at least 37.5 amperes. The wave shapes are based on the use of ideal components in Figure 68.302(c) with  $S_2$  in Position L. Surges are applied:

(i) With the equipment in all states that can affect compliance with the requirements of Part 68. If an equipment state cannot be achieved by normal means of power, it may be achieved artificially by appropriate means.

(ii) With equipment leads not being surged (including telephone connections, auxiliary leads, and terminals for connection to non-registered equipment) terminated in a manner which occurs in normal use.

(iii) Under reasonably foreseeable disconnection of primary power sources, with primary power cords plugged and unplugged, if so configured.

(3) *Failure Modes resulting from application of Type B telephone line surges.* Registered terminal equipment and registered protective circuitry shall be capable of withstanding the energy of Surge Type B without causing permanent opening or shorting of the interface circuit and without sustaining damage that will affect compliance with these rules.

***Rationale for Harmonized Requirement:***

*The issue of lightning surge simulation was controversial and was considered at length by the TR 41.9 subcommittee. Also, expert opinion was solicited from the TR-41.7 subcommittee (Environmental and Safety Considerations). The final proposal includes two types of surges (Type A and Type B). Each surge type includes metallic and longitudinal surges, and defines allowed failure modes for that type surge.*

*Type A is essentially the same as the present Part 68 requirements. The existing definition of the current surge waveform is ambiguous. It is the TIA subcommittee's understanding that the original intent of Part 68 was that the current and voltage waveshapes have the same minimum decay time. The current waveshape specification has been added to the surge definition. The text was changed for improved clarity. The longitudinal surges to each lead individually were eliminated. The allowed failure modes are unchanged.*

*Type B surges are new. The surge waveforms have lower energy, but the acceptance criteria after application of the surges are different. The surge generator for Type B surges are defined in terms of both a voltage waveform and a current waveform. Also, the configuration of the surge generator applies longitudinal surges to each lead through an independent source impedance.*

*Further, the subcommittees agreed that the best way to specify the surge generator is in terms of open circuit voltage waveform and short circuit current waveform at the output of the generator. This defines the generator in terms of measurable external properties, and also constrains the energy. Measurable external properties include front and decay times. These terms are defined in Figures 68.302(a) and (b) and are consistent with ANSI standards. An idealized circuit diagram for type B surges is given in Figure 68.302(c), but the actual requirements are the voltage and current waveforms.*



*The following discussion summarizes reasons for proposing the addition of a new surge test and for retaining the existing test.*

*Surges occur over a wide spectrum of voltages, current and energy. For purposes of evaluating equipment performance, there are Bellcore, ITU-T and TIA standards which can provide guidance. However, in Part 68 the surge is used as a conditioning stress to determine if terminal equipment could harm the network afterwards; it is not a performance standard.*

*There is a significant body of data which indicates that the energy of the present Part 68 surge is very severe, relative to actual surges that occur. Also, some manufacturers stated that there did not seem to be a correlation between performance with the FCC surge and actual field performance. For example, some products which fail open on the FCC surge (due to blowing a fuse, for instance) have not had problems with failures in the field. Because of these considerations, the surge defined in ITU-T Recommendation K.21 was suggested as a more typical surge waveform and was adopted in this proposal as the Type B surge.*

*The concern with the existing FCC surge is that the response of the equipment to lower energy surges, which are much more common, is unknown. For Type B surges the proposal is that the equipment must be capable of withstanding the energy of these surges without causing permanent opening or shorting of the interface circuit and without sustaining other damage that will affect compliance. It is not required to be fully operational, but any failures must be non-harmful. These criteria for allowable failure modes ensure that a protection strategy of failing open for high energy surges does not mask other potentially harmful failure modes at lower energies.*

*It has also been noted that there are a number of equipment failures directly attributed to lightning surges. This has resulted in a number of complaints to the FCC Staff. The committee believes that this proposal to include both surges will address these concerns.*